SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

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MEETING OF THE

SOLID WASTE TASK FORCE

NOTE CHANGE IN MEETING DATE AND LOCATION

Wednesday, September 26, 2007

10:00 a.m. – 12:00 p.m.

SCAG Offices
818 West 7th Street, 12th Floor
Conference Room – Riverside A
Los Angeles, CA 90017
213.236.1800

If members of the public wish to review the attachments or have any questions on any of the agenda items, please contact Jacob Lieb at 213.236.1921 or lieb@scag.ca.gov or Christine Fernandez at 213.236.1923 or fernande@scag.ca.gov.

Agendas and Minutes for the Solid Waste Task Force are also available at:

http://www.scag.ca.gov/rcp/solidhazardouswaste.htm

SCAG, in accordance with the Americans with Disabilities Act (ADA), will accommodate persons who require a modification of accommodation in order to participate in this meeting. If you require such assistance, please contact SCAG at (213) 236-1868 at least 72 hours in advance of the meeting to enable SCAG to make reasonable arrangements. To request documents related to this document in an alternative format, please contact (213) 236-1868.

SOLID WASTE TASK FORCE

AGENDA

PAGE # TIME

"Any item listed on the agenda (action or information) may be acted upon at the discretion of the Committee."

1.0 CALL TO ORDER & PLEDGE OF ALLEGIANCE — **Hon. Toni Young, Chair**

2.0 PUBLIC COMMENT PERIOD

Members of the public desiring to speak on an agenda item or items not on the agenda, but within the purview of the Committee, must fill out and present a speaker's card to the Assistant prior to speaking. A speaker's card must be turned in before the meeting is called to order. Comments will be limited to three minutes. The chair may limit the total time for all comments to twenty (20) minutes.

3.0 REVIEW and PRIORITIZE AGENDA ITEMS

4.0 CONSENT CALENDAR

4.1 **Approval Item**

4.1.1 Minutes of August 27, 2007 Meeting
Attachment

4.2 **Receive and File**

4.2.1 Membership List with Contact Information
Attachment

5.0 INFORMATION ITEMS

5.1	Source separation and recycling **Attachment** Richard Anthony will discuss resource strategies and recycling markets in the SCAG region and abroad.	Richard Anthony, **Richard Anthony Associates, HDR**	45 minutes
5.2	RCP Solid Waste Chapter **Attachment** Staff will present the draft solid waste chapter in its entirety.	Christine Fernandez, **SCAG Staff**	25 minutes

AGENDA

		PAGE #	TIME
6.0	**CHAIR'S REPORT**	**Hon. Toni Young, Chair**	

7.0 FUTURE AGENDA ITEMS

Any Committee members or staff desiring to place items on a future agenda may make such request.

8.0 ANNOUNCEMENTS

9.0 ADJOURNMENT

The next meeting of the Solid Waste Task Force will be held on Wednesday, October 24, 2007 in the SCAG offices in downtown Los Angeles.

Solid Waste Task Force

Minutes for August 27, 2007

The following minutes are a summary of actions taken by the Solid Waste Task Force.

The Solid Waste Task Force held its meeting at the Southern California Association of Governments offices in Los Angeles. The meeting was called to order by Chair Toni Young, City of Port Hueneme.

Members Present	**Representing**
Toni Young	**Port Hueneme**
Mike Mohajer	**LA County IWMTF**
Mike Miller	**LA County Waste Management Task Force**
Margaret Clark	**City of Rosemead**
Reina Pereira	**City of L.A. Sanitation**
Allen Wang	**City of L.A. Sanitation**
Nancy Sansonetti (phone)	**San Bernardino Solid Waste Mgmt**
Betsey Meyer (phone)	
Martin Perez	**City of Los Angeles**
Cecile Buncie	**City of Los Angeles**
Virginia Jaurez	**LACDWP**
Stan Carroll	**La Habra Heights**
Gary Liss	**Gary Liss & Assoc.**
Ruth Abbe	**HDR**

1.0 CALL TO ORDER & PLEDGE OF ALLEGIENCE

Toni Young, Chair, called the meeting to order at 10:05a.m.

2.0 PUBLIC COMMENT PERIOD

No public comment.

3.0 REVIEW AND PRIORITIZE AGENDA ITEMS

4.0 CONSENT CALENDAR

4.1 **Approval Item(s)**

4.1.1 The Minutes of July 23, 2007

4.2 **Receive and File**

4.2.1 Membership List with Contact Information

Doc #140047v1
08/21/07 D. Salcido

Consent Calendar – Con't

4.2.2 New England Transrail (NET) Case

The Consent Calendar was approved as submitted.

5.0 INFORMATION ITEMS

5.1 Green Dot Program

Ruth Abbe, SWIRP Project Manager, HDR, provided information on the European Green Dot Program and its applicability to Zero Waste programs in the United States.

She reported that manufacturers are able to place a green dot on their products to indicate to the consumer that the manufacturer of the product participates in an established national waste management program, and that instead of returning the packaging to the manufacturer or distributor, the packaging is collected, sorted, and recycled through the program.

5.2 RCP Solid Waste Chapter

Christine Fernandez, SCAG Staff, provided an overview of the draft solid waste chapter goals, outcomes, and action plan. Task force members provided several suggestions on changes to the action plan and outcomes that they wanted to see incorporated into the chapter.

6.0 CHAIRS REPORT

7.0 FUTURE AGENDA ITEMS

8.0 SET NEXT MEETING DATE/TIME/LOCATION

- Wednesday, September 26, 2007, 10 a.m. – 12 Noon

7.0 ADJOURNMENT

The meeting was adjourned at 12:00 noon.

SOLID WASTE TASK FORCE AGENDA

September 26, 2007
10:00 a.m. to 12:00 noon.

Name	Address	Phone	Fax	e-mail
Acosta, Glenn	Mr. Glenn Acosta, P.E. 1955 Workman Mill Road Whittier, CA 90601	(562) 699-7411 ext.2723	(562) 695-1874	gacosta@lacsd.org
Carroll, Stan	Mr. Stan Carroll 659 Lamat Road La Habra Heights, CA 90631	(562) 690-4645		GW1763@aol.com
Cook, Debbie	Hon. Debbie Cook 6692 Shetland Circle Huntington Beach, CA 92648	(714) 536-5553	(714) 536-5233	hbdac@hotmail.com
Clark, Margaret	Hon. Margaret Clark 3109 N. Prospect Rosemead, CA 91770	(626) 288-7308	(626)307-9218	jsavaadra@cityofrosemead.org
Martin, Kay	Ms. Kay Martin Vice President, BioEnergy Producers Assn. 236 Ferro Drive Ventura, CA 93001	(805) 653-5935		kay4bioenergy@aol.com
Miller, Michael	Mr. Michael Miller P.O. Box 4742 West Covina, CA 91791	(626) 337-1606	(626) 337-3397	millereviron@earthlink.net
Miller, Scott	Mr. Scott Miller 12360 Landale Street Studio City, CA 91604	(818) 508-5514		miller@performancepgraphics.com
Mohajer, Mike	Mr. Mike Mohajer P.O. Box 3334 San Dimas, CA 91773	(909) 592-1147		mikemohajer@yahoo.com
Nelson, Larry	Hon. Larry Nelson Councilmember, City of Artesia 18747 Clarkdale Ave Artesia, CA 90701-5899	(562) 865-6262	(562) 865-6240	lnelson@cityofartesia.org
Paxton, Lynda	Ms. Lynda L. Paxton	Office (805) 347-9990 Cell (714) 412-0745		llpaxton@comcast.net

SOLID WASTE TASK FORCE AGENDA

September 26, 2007

10:00 a.m. to 12:00 noon.

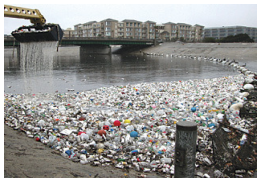
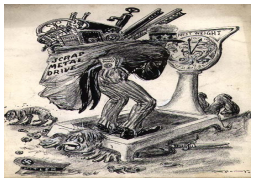
Sansonetti, Nancy	Ms. Nancy Sansonetti Supervising Planner/Chief Planning & Permitting Section Solid Waste Management Division 222 W. Hospitality Ln San Bernardino, CA 92415	(909) 386-8778	(909) 386-8964	NSansonetti@swm.sbcounty.gov
Skye, Coby	Mr. Coby Skye Associate Civil Engineer Environmental Programs Division Los Angeles Department of Public Works 900 S. Fremont Ave. Annex 3rd Floor Alhambra, CA 91803-1331	(626) 458-5163	(626) 458-35943	cskye@ladpw.org
Smith, Greig	Hon. Greig Smith Councilmember, City of Los Angeles District 12 200 N. Spring Street, 4th FL Room 405 Los Angeles, CA 90012	(213) 473-7012	(213) 473-6925	smith@council.lacity.org
Van Arsdale, Lori	Hon. Lori Van Arsdale Councilmember, City of Hemet 445 E. Florida Ave Hemet, CA 92543	(951) 765-2303	(951) 765-3785	lvanarsdale@ci.hemet.ca.us
Vizcarra, Joe	Mr. Joe Vizcarra Lt. Traffic Operations Center Los Angeles Communications Center California Highway Patrol 120 S. Spring Street Los Angeles, CA 90012	(213) 897-6136	(213) 897-0519	jvizcarra@chp.ca.gov
Young, Toni (Chair)	**Hon. Toni Young Councilmember, City of Port Hueneme 766 Polaris Way Port Hueneme, CA 93041-2333**	**(805) 986-6500**	**(805) 986-6581**	**ottoandtoni@verizon.net**

Why Require Source Separation?

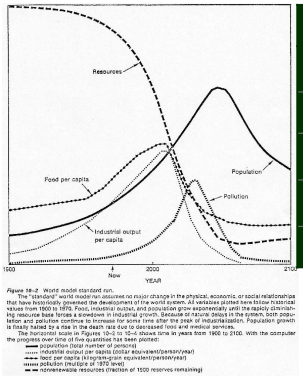
Richard Anthony
July 2007

Neither the Bible nor the Constitution give anyone the right to Pollute or Waste



Reuse, Recycling, & Composting Reduce Resource Use & Greenhouse Gas Production



	Aluminum	Steel	Paper	Glass
Energy Use	90-97%	47-74%	23-74%	4-32%
Air Pollution	95%	85%	74%	20%
Water Pollution	97%	76%	35%	
Mining Wastes		97%		80%
Water Use		40%	58%	50%

[1] *R. Letcher and M. Shiel, "Source separation and Citizen Recycling", in William Robinson, ed., The Solid Waste Handbook, New York, 1986.*

All discards can be sorted into 12 Market Categories…

1. **REUSABLE**
   - Appliances
   - Durable Plastic Items
   - Textiles
   - Mattresses & Furniture
   - Composite C & D
   - Books & Catalogues
   - Other Repairables
2. **PAPER**
   - Cardboard
   - White Ledger
   - Newsprint
   - Magazines / Catalogs
   - Other Office Paper
   - Paperboard
   - Other / Composite Paper
3. **PLANT DEBRIS**
   - Leaves & Grass
   - Prunings
   - Branches & Stumps
4. **PUTRESCIBLES**
   - Food Waste
   - Fish and Meat Waste
   - Sewage Sludge
5. **WOOD**
   - Untreated Wood
   - Treated Wood
6. **CERAMICS**
   - Concrete
   - Asphalt Paving

7. **SOILS**
   - Gypsum Board
   - Fines

8. **METALS**
   - Auto Bodies
   - Aluminum Cans
   - Steel Cans
   - Ferrous Metals
   - Non-Ferrous

9. **GLASS**
   - Clear Glass Containers
   - Mixed Glass Containers
   - Clear Glass
   - Green Glass
   - Mixed Glass
   - Brown Glass
   - Window Glass
   - Other Glass

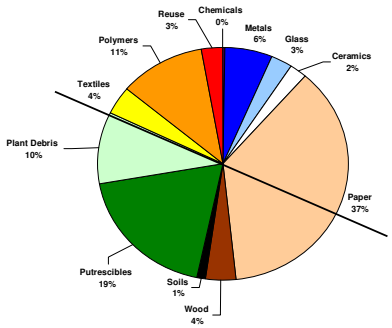
10. **TEXTILES**
    - Poly Fibers
    - Cotton and Wool

11. **POLYMERS**
    - #1 PET (CRV)
    - #2 HDPE Colored
    - #2 HDPE Natural
    - #1 PET Plastic
    - #4 Plastic Bags
    - Tires
    - Other Plastics
    - Asphalt Roofing
    - Film Plastics

12. **CHEMICALS**
    - Used Motor Oil
    - Household Hazardous Waste
    - Disposable Diapers / Feminine Hygiene
    - Treated Medical Waste

Discards Sorted into the 12 Market Categories

Note: Half of the Pie is Organic Material Suitable for Composting



Revenue and Job Potential from 1,000,000 Tons of Discarded Material

Clean Dozen[SM] Master Categories	Jobs	Tons per Year	Market Price $/T (est.)	Total Value of Discards ($)
1. Reuse	350	28,000	550	15,400,000
2. Paper	65	370,000	20	7,400,000
3. Plant Trimmings	30	100,000	7	700,000
4. Putrescibles	85	190,000	7	1,330,000
5. Wood	24	40,000	4	320,000
6. Ceramics	7	20,000	4	80,000
7. Soils	20	10,000	7	70,000
8. Metals	35	60,000	40	2,400,000
9. Glass	75	30,000	10	300,000
10. Polymers	1,020	110,000	100	11,000,000
11. Textiles	340	40,000	200	8,000,000
12. Chemicals	4	2,000	15	30,000
Total	2,055	1,000,000		47,030,000

Master Category Clusters

- **Paper and Containers/Blue Bin**
  - Paper, metals, glass, polymers
- **Organics/Green Bin**
  - Food, vegetative debris, food dirty paper, paper, plant debris, putrescibles, wood
- **Discarded Items/Bulky or Charity Pickup**
  - Furniture, appliances, clothing, toys, tools, reusable goods, textiles
- **Special Discards Resource Recovery Park**
  - Chemicals, construction and demolition materials, wood, ceramics, soils

Reuse and Repair




Recycling



Composting




Special Discards



zerowastesandiego.org

Landfilling is a long-term liability, produces dangerous greenhouse gases, and wastes taxpayer dollars.

The following programs and policies offer economic sustainability, improved quality of life for residents, and a healthier, cleaner environment:

- Pass the required mandatory recycling ordinance to allow recycling for all residents and businesses
- Transform the Miramar Landfill into a resource recovery park
- Phase out compostable materials from the landfill
- Trigger the C&D ordinance
- Implement a public education program to maximize recovery of revenue-generating recyclables

The most logical way to extend the life of the landfill is to convert as many discarded resources as possible into revenue.

This RCP chapter is meant to take a close look at some of the challenges in solid waste management that we, as a region, are facing. It will provide a framework for taking the first steps toward a solution. Because this will be an ongoing process, there are some issues -- such as hazardous waste, that have not been specifically addressed. However, it is implied that many of the policies described for solid waste management will also apply to management of hazardous wastes.

INTRODUCTION

The problem of waste

California residents generate an average of 2.1 pounds of garbage a day (CIWMB, 2007 – Statewide Profiles). For our entire region, this equates to approximately 40 million tons of garbage generation per year. Existing landfills are quickly filling to capacity. Between 1990 and 2005, our region disposed of, on average, 20 millions tons of municipal solid waste (MSW) annually in local landfills. The amount of garbage we generate will only continue to grow as our region's population grows.

Traditional solid waste management strategies have relied heavily on creating high capacity, regional landfills (megafills) and, to a lesser extent in California, incineration technologies to address disposal issues. Although the state as a whole is not experiencing a landfill shortage, many areas, especially the densely populated, metropolitan regions are finding it difficult to site new facilities due to the lack of vacant land and the unwillingness of residents to have landfills built near their homes. Consequently, landfills are being built bigger and sited further away from populated areas, increasing transportation costs and infringing on natural areas and wildlife habitat. As landfill space decreases, the costs for landfilling our garbage will continue to grow, ultimately being passed on to residents and businesses in the form of higher disposal fees and eventually, in conspicuous impacts to public health and the environment.

"There's no away to throw to."
(-Hardin's Second Law of Human Ecology, Garrett Hardin, 1993)

Why are landfills a problem?

Communities that are unlucky enough to have a landfill nearby are exposed to numerous health hazards including landfill emissions, unpleasant and possibly toxic odors, dust from truck traffic and waste dumping activities, noise from landfill operations, pests (insects, rodents, vermin), and dangerous truck traffic. These conditions can cause property values to decrease within a mile or so of the landfill.

These problems are not just limited to the adjacent communities. Landfill emissions aggravate air quality problems, are a major source of greenhouse gases, and are a threat to groundwater aquifers.

[GRAPHIC: emissions from landfill operations]

Air quality and GHG emissions

Landfill emissions are mainly composed of (1) gases, such as methane, carbon dioxide, and a small fraction of volatile organic compounds (VOCs) and (2) toxic leachate[1] (garbage juice). The typical composition of landfill gas is 45-60% methane, 40-60% CO_2, 2-5% N_2, and a small percentage of a variety of other gases, including hydrogen sulfide and carcinogenic VOCs such as benzene, toluene, xylene, and vinyl chloride (ASTDR, 2001). Many VOCs also react with nitrogen oxides (NOx) in the air to create ground-level ozone and smog. Landfilling activities and truck traffic throw dust and particulate matter into the air.

In addition to exacerbating the air quality crisis, landfills are a major contributor of greenhouse gases. Worldwide, landfills account for 25% of human-made methane emissions. Methane is a more potent greenhouse gas than carbon dioxide; it has approximately 21 times the global warming potential than CO_2 (EPA, 2007).

One of the most tangible effects of landfills is the number of health complaints caused by odors. Many people living near landfills complain of, nausea, headaches, increased respiratory symptoms, sleeplessness, and psychological[2] problems (ASTDR, 2001). Researchers have attempted to link landfill odors and gas emissions with increased risks of birth defects and cancer, but studies have so far proved inconclusive.

Water quality hazard

Although landfills today are technically sophisticated and highly regulated facilities, fugitive emissions are still present and leachate barrier (landfill liners) and collection systems are still prone to failure. According to the EPA, "the more reasonable assumption, based on known pressures placed on liners over time, is that any landfill liner will begin to leak eventually" (Lee, 2007).

Landfill leachate also poses a potential threat to groundwater aquifers. Once leachate contaminates an aquifer, it is very difficult to cleanse the aquifer of the pollution. The aquifer can no longer be considered reliable for human consumption (Lee, 1994). Since landfill liners will eventually leak, future generations may have to deal with Superfund-type[3] groundwater remediation from landfill leachate pollution in groundwater.

The affect of MSW leachate on public health is not well-studied. A review of studies on the relationship of health and landfill proximity has shown little correlation with epidemiological patterns. However, there are well over 65,000 chemicals in US commerce with 1,000 new chemicals being added each year and only about 200 are regulated and measured in studies of landfill leachate contamination (Lee, 1994). Currently, there are approximately 75,000 toxic chemicals in the EPA's TSCA inventory (EPA, 2006).

As awareness of landfill-related health and environmental issues has increased, it has become more difficult to site, open, and operate new facilities. Understandably, no one wants to live near a landfill. Dwindling landfill capacity and increasing health and environmental concerns have forced both the region and the state to make concerted efforts at developing other waste management methods including reducing the amount of waste that goes into landfills.

[1] Leachate is a concentrated chemical soup produced as water percolates through decomposing garbage in a landfill. Toxic chemicals are produced or leached from the decomposition of both toxic and non-toxic trash.
[2] The added disruption of constant exposure to odors can increase stress and impact a residents' day to day quality of life (ASTDR, 2001).
[3] Superfund is the name given to the environmental program established to address abandoned hazardous waste sites (EPA, 2007 http://www.epa.gov/superfund/about.htm)

Natural Resource Consumption

Overflowing landfills are only a symptom of a bigger problem; overexploitation and inefficient use of our natural resources and the subsequent results of this inefficiency – waste and the associated environmental impacts. Natural resource extraction of the degree seen today has already created health and environmental impacts that will last long into future generations.

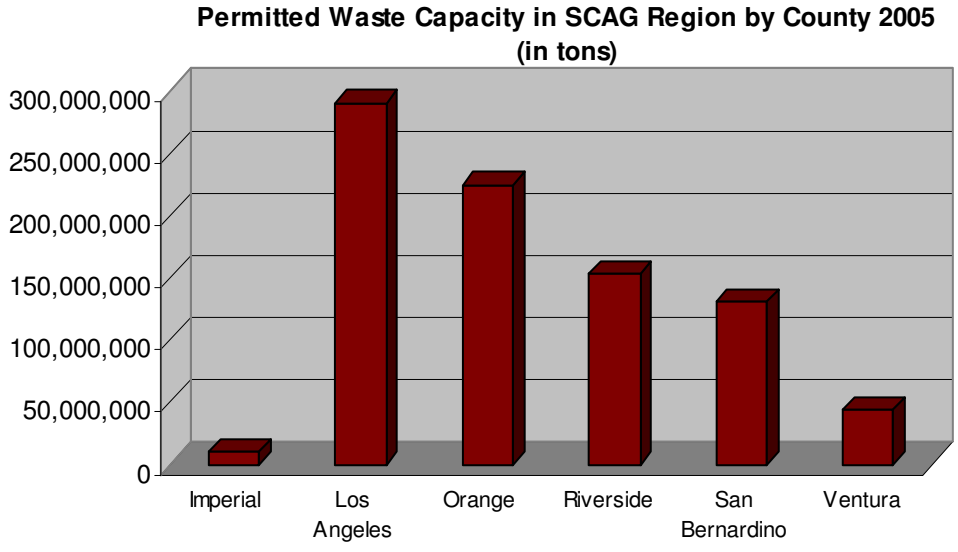
The mining industry moves an estimated 28 billion tons of soil and rocks each year (globally) to use in the creation of products that we easily replace or throw away. Mining leaves behind a wake of destructive impacts. From threatening local and global biological diversity because of habitat destruction to increased chemical contamination, erosion, and silting of lakes and streams to toxic air pollution containing arsenic and lead emissions. Even land use decisions contribute to the problem. For example, sprawl consumes two times the amount of material than urban redevelopment. (Fishbein et al., 2001). Resource extraction and related activities also contribute to greenhouse gas emissions, air quality and water quality problems, and energy consumption.

[GRAPHIC – CHART OF ANNUAL PERMITTED DISPOSAL AMOUNT]

SIDE BAR: DISPOSAL FACILITIES

There are approximately fifty disposal facilities (landfills) in the SCAG region, almost half of are located in Los Angeles County. The total permitted capacity for the region is over 800 million tons, with a combined annual maximum permitted disposal amount of 42.8 million tons, providing nearly 14 years of aggregate capacity for the entire region, if the landfills receive the maximum annual disposal for which they are permitted (Burr, 2006). Figure XXX presents a summary of the permitted waste capacity by County.

Graph: Permitted Waste Capacity in SCAG Region by County 2005



HOW CAN WE SOLVE OUR GARBAGE PROBLEM?

We will need a combination of both short and long term solutions to address our overwhelming waste problem. Shrinking landfill capacity and public opposition to siting disposal facilities in urban areas will force us to transport waste to more distant landfills. This is currently the case with the planned Waste-By-Rail system for L.A. County. The system is designed to address the projected shortfall of disposal capacity in Los Angeles County by efficiently transporting waste to out-of-county facilities. The system will have multiple starting points, at large-scale materials recovery facilities throughout Los Angeles County. At these sites, waste will be loaded into shipping containers ("intermodal containers") and delivered to the rail loading station (the "intermodal facility") by truck. The rail system will use existing rail lines to transport the waste to the Mewquite Regional Landfill. Mesquite Regional Landfill is located in Imperial County, approximately 35 miles east of Brawley. Although exporting waste is not the most preferable option, it is currently the only viable strategy for the L.A. County's projected disposal capacity shortfall.

Diverting garbage away from landfills

In 1989, the legislature passed the California Integrated Waste Management Act (AB 939). This bill mandated a 50% solid waste diversion[4] rate by the year 2000 for all waste management jurisdictions in California. Since then, Californians have made great strides in reducing the amount of waste sent to landfills. Although not all individual jurisdictions have managed to achieve the 50% diversion rate, they are doing all they can to comply with the mandate. *Statewide* the estimated diversion rate for 2006 is 54%. This diversion rate translates to 50.1 million metric tons of waste (out of 92.2 million metric tons of waste generated) that avoided disposal to landfills (CIWMB, 2007).

Economic Benefits of Diversion

Diversion activities create jobs, add revenue, and help stimulate other economic sectors. Some employment opportunities created by these activities include government and private staffed collectors, recyclable material wholesalers, compost and miscellaneous organics producers, materials recovery facilities, glass container manufacturing plants, plastics converters, and retail used merchandise sales. A 2001 report released by UC Berkeley stated that, "diverting solid waste has a significantly higher (positive) impact on the economy than disposing it." Diversion also helps communities save money by avoiding payment of tipping fees[5] on each ton of waste disposed. The UC Berkeley study estimated that statewide economic impacts from disposal and diversion at 1999 rates were approximately 17 to 20 percent higher than the impacts if all the waste had been disposed (Goldman and Ogishi, 2001). This is because reuse and recycling are inherently value-adding, whereas disposal is not; and value-adding processes support jobs and economic activity (REI, 2001).

Table X.X. Economic Impacts of 1999 waste generation going to disposal or disposal and diversion.

Region	Estimated Final Sales 1999 (billions of	Impact on Economy			
		Output[b] (billions of	Total Income[c] (billions of	Value Added[d] (billions of	Number of jobs created

[4] Diversion is generally defined as the reduction or elimination of the amount of solid waste from solid waste disposal (to landfill or incineration). Source reduction (waste prevention), recycling, reuse, and composting activities are considered diversion.

[5] The fee charged for unloading solid waste at a landfill or transfer station. http://www.ciwmb.ca.gov/LGCentral/Glossary.htm#sz

		dollars)	dollars)	dollars)	dollars)	
All California	Disposal only	7.5	18.0	6.8	9.0	154, 000
	Disposal and Diversion	9.2	21.2	7.9	10.7	179,000
Southern California[a]	Disposal only	4.1	9.6	3.6	4.7	82,000
	Disposal and Diversion	5.1	11.3	4.2	5.6	95,000

Table adapted from Goldman, G. and A. Ogishi, 2001. The Economic Impact of Waste Disposal and Diversion in California. A Report to the California Integrated Waste Management Board.
[a] Southern California region includes all six SCAG region counties plus San Diego County.
[b] Output impact is a measure of how the disposal sectors influence total sector sales in the economy.
[c] Income impact measures income attributed to disposal-related economic sectors.1
[d] Value added is the increase in the value of goods and services sold by all sectors of the economy.

Is Diversion Enough? –THE ZERO WASTE STRATEGY

Even with a XX% diversion rate, our region still generates massive quantities of waste. In the last 10-15 years there has been a strong movement to recognize the inextricable link between the waste we generate and our consumption of natural resources. A sustainable solid waste management strategy is one that acknowledges this link and recognizes that the current model our society operates on – depleting natural resources to create throwaway products – is an unsustainable one. Today's economy is based on the extraction of "cheap" resources to make products that are largely designed to end up in landfills.

> "At the heart of the concept of sustainability is a fundamental, immutable value set that is best stated as *'parallel care and respect for the ecosystem and for the people within'*. From this value set emerges the goal of sustainability: to achieve human and ecosystem well-being together. It follows that the 'result' against which the success of any project or design should be judged is the achievement of, or the contribution to, human and ecosystem well-being together. Seen in this way, the concept of sustainability is much more than environmental protection in another guise. It is a positive concept that has as much to do with achieving well-being for people and ecosystems as it has to do with reducing stress or impacts." (Tisdell, 1988)

Zero Waste goes beyond waste diversion by addressing waste elimination at the source and distributing the responsibility for waste on both the consumer and the producer. The strategy requires that we look at waste management in an entirely different way. Instead of managing the end results of our consumption-related activities – trash, we focus on resource conservation and management. The aim is to create a whole system approach to the way materials flow through society, where all discarded materials are resources for others to use and resource conservation and recovery is built into every process. Zero Waste means designing and managing products and processes to reduce impacts to the environment, volume and

toxicity of waste and materials, and waste of natural resources. It is important to note that 100% Zero Waste can probably never be achieved but, "we can get darn close!" [Zero Waste New Zealand Trust, 2003; Zero Waste International Alliance, 2007]

"When we try to pick out anything by itself, we find it hitched to everything else in the universe. "
John Muir

© Eco-Cycle 2005. Contact Eco-Cycle to use graphics and/or text.
[GRAPHIC: Zero Waste Materials Flow – example above]

SIDEBAR: List of Zero Waste communities
Many communities in (and out) of the SCAG region are already aiming for Zero Waste!

- City of Los Angeles: 70% diversion by 2020; 90% by 2025 **(RENEW LA Plan; Zero Waste Plan)**
- City of Santa Monica: 70% diversion by 2010; **(In Sustainable City Plan)**
- City of Oakland: 75% diversion by 2010; Zero Waste by 2020.
- City of Pasadena: Zero Waste by 2040 **(In Green City Action Plan).**
- Culver City **(In Sustainable Community Plan)**
- State of California, Integrated Waste Management Board **(Zero Waste California)**
- Rancho Cucamonga
- San Bernardino Zero Waste Communities
- San Francisco City and County
- Berkeley: 75% 2010; Zero Waste 2020.
- Seattle, WA
- City of Boulder, CO
- New Zealand adopted ZW as a goal

In Zero Waste, the three Rs of waste management – Reduce, Reuse, Recycle – still hold true, but with the emphasis placed on the first R. This means. making more concerted efforts to reduce waste generated by both the producer and the consumer while continuing to maximize recycling and reuse efforts. It also means implementing alternative technologies to deal with waste that cannot be recycled as well as managing materials flow to prevent the creation of un-recyclable products. One of the most effective ways to manage waste is to prevent it from being produced in the first place.

To this end, Zero Waste promotes strategies that look at the entire product life cycle to assess the true economic, environmental, and health-related costs of manufacturing a product. Life cycle assessments[6] (LCAs) attempt to appraise all the inputs and outputs that are associated with the creation and disposal of a product. Included are the direct inputs to the production process, associated wastes and emissions, and the future (downstream) fate of the product.

SIDE BAR: **Life Cycle Assessments (Analyses)**

Life Cycle Assessments (LCAs) need not be limited to analyzing the life cycle of a single product. LCA is a methodology that can analyze the interactions of a technological system with the environment. It can be used as a decision-making tool to help weigh environmental and health impacts between various waste

[6] Also referred to as Life Cycle Analysis

management options. If used correctly[7], LCAs can answer questions like, "Are impacts from manufacturing aluminum cans from raw material really much worse than the impacts from re-manufacturing of recycled aluminum and if so, how much worse?" and "Have the costs of environmental and health impacts, such as losing ecosystem services[8] and the loss of worker days been calculated into the costs?" Governments, private firms, consumer organizations, and environmental groups can all use LCA as a decision support tool (Tan and Culaba, 2002).

Through LCAs and similar applications, a sustainable, economic market can be created by developing more efficient systems that minimize the need for virgin materials and maximize the use of materials already available. By evaluating the existing materials flowing through a community, we can identify opportunities to take what one business considers a byproduct or waste and provide that material to another business that can use it as a production feedstock or input. This is good policy for the region as existing businesses can save money by creating efficiencies in production (CCRED, n.d.).

The 2004 Growth Vision recognized this and stated that "management of solid waste (and hazardous waste) must be sustainable in order to efficiently manage natural resources and in order to protect the environment today and in the future."

PREVENTION

Waste comes from many sources. It is generated by residents, businesses, industrial enterprises, and the construction and demolition (C&D) industry. In California, the waste stream is composed primarily of, by volume, organic (food) waste, paper products, and construction and demolition debris. But harder-to-decompose items such as plastic, glass, metal, electronic, and hazardous wastes are also present in the waste stream in significant amounts. (see Figure X.X).

[GRAPHIC: Material classes from CA's overall waste stream, 2003]

Product Stewardship & Extended Producer Responsibility

Product stewardship is a product-centered approach to environmental protection. It extends the responsibility for a product to everyone involved in the product lifecycle (EPA, 2007b). This means that manufacturers and producers design products that are recyclable, reusable, less toxic, less wasteful, and/or more durable. Retailers and consumers are then responsible for ensuring that proper recycling and disposal of products occur.

Product stewardship is often used interchangeably with Extended Producer Responsibility (EPR). However, EPR focuses the brunt of the responsibility for creating an environmentally compatible product on the manufacturers and producers of the product. Producers retain responsibility for their end-of-life (EOL) products, which should induce them to address the problems of reengineering and designing for dismantling, reuse, and recycling. For example, businesses making products that are leased, such as HP (photocopiers) have long known that their products will be returned so they have learned to make

[7] The Society for Environmental Toxicology and Chemistry (SETAC) has defined guidelines for the stages of a generic product life cycle that must be considered in LCAs. (Tan and Culaba, 2002)

[8] Ecosystem Services are the processes necessary to sustain and fulfill human life by which the environment produces resources that we often take for granted such as clean water, timber, habitat for fisheries, and pollination of native and agricultural plants. Many of these services are seemingly "free", yet are worth trillions of dollars (ESA,n.d.)

remanufacturing profitable [Clift and france, 2006]. When businesses are compelled to internalize the true costs of wasteful packaging and inefficient material use, there is incentive to create more efficient waste management strategies.

EPR policies should give producers an incentive to design products that:

1) uses fewer natural resources
2) uses greater amounts of recyclate in the manufacture of the product
3) can be reused
4) can be more easily treated/dismantled and recycled
5) reduces or eliminates the use of hazardous substances or materials in the manufacture of a product

The long-term purpose of EPR is to encourage more environmentally friendly product development --- products that require fewer resources, are easier to reuse/recycle, and which contain fewer environmentally dangerous substances (Strenström and Ritchey, 2004). The concept promotes a more sustainable approach to resource use and a reduction in the quantity of waste going to a landfill, by diverting end of life products to re-use, recycling, or other forms of recovery. Many corporations are recognizing the value of EPR and have developed voluntary EPR strategies in their organizations.

Voluntary examples of EPR in U.S.

Xerox's Asset Recycling Management Program – a model EPR program which has led to extensive product redesign. The program has generated substantial profits by maximizing recovery of the residual value of office equipment, which the company takes back at the end of its useful life.

Kodak's take-back and recycling program for single-use cameras has had marketing benefits in helping to dispel these products' image as throwaway items that quickly end up in the landfill.

Interface, a global carpet company, has a program to lease carpet and recycle it at the end of its life. DuPont, 3M, Milliken and Collins & Aikman are also taking back and recycling carpeting.

DuPont has a program to take back and recycle PET packaging films.

REUSE & RECYCLING

California hosts approximately 5300 recycling and reuse establishments employing 84,000 people generating an annual payroll of $2.2 billion and $14.2 billion in annual revenues (NRC, 2001). However, even with , California's recycling market is still on shaky ground. The reuse industry….

But they have many of the same benefits though recycling activities magnify these benefits many more times.

Reuse and recycling reduce the need for landfilling and prevent pollution caused by the manufacturing of products from virgin materials. Help conserve natural resources (timber, water, minerals); help sustain the

environment for future generations; decrease emission of GHGs that contribute to global climate change, protects and expands U.S. manufacturing jobs and increases U.S. competitiveness, saves energy. These benefits are not just limited to recycling. (EPA, 1998)

GRAPHIC: Simplified Life cycle of products (recycled and raw materials) –

GRAPHIC: R,R,R Waste Heirarchy

STRATEGIES

Reducing Construction and Demolition (C&D) Debris

According to the most recent CIWMB Waste Characterization Study, construction and demolition debris comprise 21.7% of California's overall disposed waste stream. Lumber debris makes up half of that figure, followed by concrete, asphalt roofing, gypsum board, and composite/remainder C&D. In **20XX**, approximately 8.7 million tons of C&D debris was disposed. Unlike demolition waste, up to 80% of construction waste is reusable or recyclable. (City of SM)

Addressing C&D waste prevention can be as simple as using best practices such as advanced framing, double checking measurements to reduce sizing mistakes, and using durable materials that need less frequent replacement (Alameda County, 2006). It also means using green building design principles to maximize the use of remanufactured, recycled, or more efficient materials or materials that are designed to be replaced in a modular manner and minimize the use of virgin materials.

Food Waste

Californians throw away more than 5 million tons of food scraps each year. That adds to 16 percent of all disposed materials going into landfills coming from food waste from businesses, residents, and institutions such as schools and prisons. Although green material collection programs have been implemented in many cities and counties, management of food scraps provides additional opportunities to help meet the State's diversion goals as well as provide greater uses for this resource. The CIWMB suggests the following order for food scrap management: (1) prevent food waste, (2) feed people, (3) convert to animal feed and/or rendering, and (4) compost. Large events and venues, public facilities (e.g., public agency and school cafeterias), and private business such as restaurants and grocery stores could all be targeted for food waste diversion activities.

Conversion Technologies

Conversion technologies (CTs) refer to a diverse set of processes used to convert waste products into high-value goods such as industrial chemicals or gas, liquid, and solid fuels. Fuel products can be burned to produce energy or refined for higher quality uses to make a variety of industrial products. The attraction of CTs is their ability to convert landfill waste into products that can take the place of fossil fuels mined from natural resources.

CTs target post-recycled municipal solid waste residuals currently destined for disposal as their feedstock. That is, before waste is sent to a CT facility, it is sorted to make certain recyclables are removed and collected. Many CT proponents feel CTs with recycling offer a much better alternative than incineration or disposal to landfill.

A study conducted for CIWMB compared a life cycle analysis of landfills (with various stages of landfill gas collection), waste to energy (WTE) combustion (incineration), and hypothetical conversion technologies. It was found that the hypothetical CT scenario could potentially have a two times lower net energy consumption when compared to the incineration scenario and up to 11 times lower than landfill without energy recovery. The CT scenario included energy savings (10-20% of the total net energy savings) from additional materials recycling prior to conversion and the offsets associated with the prevention of extraction and production of virgin materials (CIWMB, 2005). However, the environmental benefits of conversion technology scenarios are highly dependent on their ability to achieve high conversion efficiencies and high materials recycling rates.

The best feedstock for CTs are carbon-rich items such as sewage sludge, plastics, tires, agricultural waste, wood, and other paper products. This raises concerns that CTs could potentially discourage recycling. It is therefore important that issues such as these be addressed to properly integrate a CT facility into the zero waste strategy. All conversion technologies will produce a small amount of solid residue that will need to be disposed in landfills. The public health impacts of conversion technologies are still being assessed, but CTs with appropriate controls and emissions technology produce lower emissions of criteria air pollutants (NOx and SOx) and CO2 than landfills (CIWMB, 2005).

At the current time, conversion technologies are considered ineligible as a diversion strategy and the permitting and siting of CT facilities has been met with opposition partly due to the concerns mentioned above. In the eye of the Integrated Waste Management Board, there is a high level of uncertainty regarding the environmental performance of CTs. Conversion technologies have been around for decades, but it is only recently that their applicability to solid waste management has begun to be fully developed. However, the successful development and use of CTs is already occurring in Japan, Germany, and the UK.

It should be noted that conversion technologies are not the definitive answer to the overflowing waste problem. Rather, like waste-to rail initiatives, they are only a part of the solution as we move forward to achieve Zero Waste goals.

Two main types of conversion technologies are being developed for management of solid waste - thermochemical conversion and biochemical conversion.

Thermochemical conversion

Thermochemical conversion is characterized by processes that use high temperatures to achieve high conversion rates of dry, organic material. These processes include gasification, pyrolysis, plasma arc, and catalytic cracking. **Advanced thermal conversion (advanced thermal recycling) primarily refer to technologies that employ only pyrolysis and/or gasification to process municipal solid waste [Defra, 2005].** The primary products of thermochemical conversion technologies include: fuel gas (syngas - CO_2, CO, CH_4, H_2), heat, liquid fuel, char, and ash.

Gasification means the conversion of solid or liquid carbon-based materials by direct or indirect heating. Gasifiers typically operate at 1300˚F and higher. Gasification is optimized to produce a fuel gas with a minimum of liquids and solids. The fuel gas (syngas), is primarily carbon monoxide (CO), hydrogen (H_2), methane (CH_4), and lighter hydrocarbons in association with carbon dioxide (CO_2) and nitrogen (N_2), depending on the process used. The definition of gasification in Public Resources Code (PRC) 40117 is inaccurate and actually describes pyrolysis.

Pyrolysis is the thermal decomposition of feedstock at medium to high temperatures (greater than 400˚F, typically in the range of 750-1500˚F) in the absence of oxygen. Pyrolysis is similar to gasification and can be characterized as an incomplete gasification process. The end product of pyrolysis is a mixture of solids (char), liquids (oxygenated oils), and gases (methane, carbon dioxide, and carbon monoxide) with proportions determined by operating temperature, pressure, oxygen content, and other conditions.

Biochemical Conversion

Biochemical conversion processes use lower temperatures than thermochemical conversion and have lower reaction rates. These processes are focused on the conversion of biodegradable organics found in MSW residue into high energy products. The products of bioconversion are biogas (CH_4 and CO_2), biofuel (ethanol, biodiesel, fuel oil, etc.), and residue that can be used for compost. Biogas usually has less energy (Btu/ft^3) than syngas produced by thermal conversion systems (URS). Non-biodegradable organic feedstocks, such as most plastics, are not convertible by biochemical processes.

THE ACTION PLAN

All of the strategies that have been laid out are meant to provide guidance and background for implementing the action plan that follows. The goal attempts to encapsulate the vision for solid waste and resource management that will move our region toward a more sustainable and healthier future. This will require a coordinated effort of implementing all of the short-term and long-term policies/actions that are contained within this plan. Some, of which require, changing how our whole region thinks about solid waste management issues.

Goal

A Zero Waste[9] region that conserves our natural resources, reduces our reliance on landfills, and creates new economic opportunities in the most environmentally responsible manner possible.

Outcomes

- All SCAG region jurisdictions should meet a 30% waste disposal rate by 2035 to minimize landfilling through appropriate employment of the technology is permitted and diversion credit is provided by the State including, but not limited to, appropriate and environmentally sound conversion technology and other actions and strategies contained in this chapter.

- Conversion technologies should be available as a diversion strategy in the next five years with one or more new conversion technology facilities sited in the SCAG region by

[9] Zero Waste does not assume that 100% of waste is ultimately diverted from landfills. Rather, it is a whole system approach that aims to completely change the way materials flow through society with a goal of no waste being generated.

Solid Waste Action Plan

Constrained Actions

SW 1.01. Local governments should update general plans to reflect solid waste sustainability issues such as waste reduction goals and programs (1996 RCP; 135).

SW 1.02. Local governments should discourage the siting of new landfills unless all other waste reduction and prevention actions have been fully explored. If landfill siting or expansion is necessary, landfills should be sited with an adequate landfill-owned, undeveloped land buffer to dilute the adverse impacts of the landfill in neighboring communities.

SW 1.03. Local governments should discourage exporting of locally generated waste outside of the SCAG region. Disposal within the county where the waste originates shall be encouraged as much as possible. Green technologies for long-distance transport of waste (e.g., clean engines and clean locomotives or electric rail for waste-by-rail disposal systems) should be given primary consideration.

SW 1.04. Local governments should adopt Zero Waste goals and practices and look for opportunities for voluntary actions to exceed the 50% waste diversion target.

SW 1.05. Federal, State and Local jurisdictions should further develop Zero Waste intitiatives that support and promote Extended Producer Responsibility (EPR) and Product Stewardship policies aimed at preventing waste; assist in the development of viable, sustainable recycling markets; and stimulate local, national, and international markets for recycled commodities. For example, CIWMB's Recycling Market Development Zone (RMDZ) program provides loans and technical assistance to businesses located in a specific zone that use materials from the waste stream to manufacture their products

SCAG ACTIONS:

SW 1.06. SCAG shall encourage all levels of government to advocate for source reduction and waste prevention.

SW 2. Develop and support waste prevention, reduction, and recycling practices. (Build recycling markets for the region.)

SW 2.01. CIWMB should increase waste diversion incentives to promote waste diversion past the current 50% diversion mandate of AB939.

SW 2.02. Local governments should adoption and implement of green building ordinances that: (a) help divert construction and demolition debris from landfills and (b) encourage the use/reuse of recycled/reusable materials in construction projects. *The ordinance should require the inclusion of a waste management plan that promotes maximum reuse and recycling of construction and demolition debris in construction contracts.*

SW 2.03. Local governments should develop ordinances that promote waste prevention and recycling such as: requiring waste prevention and recycling efforts at all large events and venues; implementing recycled content procurement programs; and instituting ordinances to divert food waste away from landfills and toward food banks and composting facilities.

SW 2.04. The State should implement AB 75 which requires all State Agencies to implement a recycled content procurement program known as the State Agency Buy Recycled Campaign (SABRC).

SW 2.05. The Federal government should enact legislation that require federal government agencies or agencies receiving federal funds to institute a recycled content procurement program, favoring the purchase of recycled products over products produced with virgin materials.

SW 2.06. Federal and State governments should explore financial incentives such as tax credits, subsidies, and price supports for waste diversion activities that include waste reduction, recycling, composting, and conversion technologies.

SCAG ACTIONS

SW 2.07. SCAG shall encourage policies that: promoting the expansion of recycling programs and facilities that provide local recycling services to the public and private sectors; encourage the development of viable, local, and sustainable markets to divert materials from landfills (e.g., recycling markets).

SW 2.08. SCAG shall encourage and advocate for legislative approaches to help market recyclables through cost-effective financial support.

SW 2.09. SCAG shall adopt and implement "green" procurement policies and participate in programs that promote the purchase of recycled content products

SW 3. Support environmentally friendly alternative waste management strategies such as composting and conversion technologies.

SW 3.01. CIWMB should provide information concerning the costs and benefits of waste management strategies like, composting and various recycling technologies, to local governments.

SW 3.02. CIWMB, Air Resources Board, and the California Water Resources Board should coordinate to address regulatory challenges and streamline the permitting process for solid waste conversion and composting technologies.

SW 3.03. Developers and local governments should develop and site composting, recycling, and conversion technology facilities that are environmentally friendly and have minimum environmental and health impacts.

SW 3.04. The Federal government and CIWMB should establish policies that provide (a) diversion credit for beneficial use of **post-recycled, solid waste residuals** managed at non-burn conversion technology facilities, and (b) separate and remove conversion technologies from the definition of "transformation."

SW 3.05. Federal, State, and local governments should support and encourage federal and state incentives for the research and development of pilot or demonstration projects for solid waste conversion technologies.

SCAG ACTIONS

SW 3.06. SCAG shall support and encourage the CIWMB to conduct life cycle assessments of **all** components of the waste **disposal** and **diversion** processes, including but not limited to, conversion technologies, composting, recycling, and waste disposal at landfills. This analysis must include the environmental impacts, including emissions, use of resources and personnel, and costs of same to collect wastes and recyclables, transport locally or anywhere in the United States or internationally, process to separate recyclables, and production of end products using collected recycled materials.

SW 3.07. SCAG shall continue to support and encourage legislation that advocate for the elimination of unnecessary duplication and/or restrictive regulations that hinder recycling, reuse, composting and conversion of solid waste and redefines conversion technologies as a diversion strategy to allow development of these facilities in the SCAG region.

SW 4. Coordinate regional approaches and strategic siting of waste management facilities.

SW 4.01. State and local governments should facilitate the creation of synergistic linkages between community businesses and the development of eco-industrial parks and materials exchange centers where one entity's waste stream becomes another entity's raw material by making priority funding available for projects that involve co-location of facilities.

SW 4.02. Developers and local governments should prioritize siting of new waste management facilities including recycling, composting, and conversion technology facilities in conjunction with existing waste management or material recovery facilities.

SCAG ACTIONS

SW 4.03. SCAG should coordinate region-wide initiatives on source reduction, reuse, recycling, composting, and conversion technology to increase economies of scale.

SW 4.04. SCAG should encourage the distribution of industrial impacts from all types of solid waste management facilities including recycling, composting, and conversion technology facilities.

SW 5. Coordinate educational approaches.

SW 5.01. Local governments should increase programs to educate the public and increase awareness of reuse, recycling, and composting benefits and raise consumer education issues at the County and City level, as well as at local school districts and education facilities.

SW 5.02. CIWMB should actively promote education regarding reuse, recycling, composting and solid waste conversion technology programs; provide information concerning the costs and benefits of these programs to local governments; and facilitate state and local government coordination of consumer awareness programs to minimize unnecessary duplication of effort in solid waste outreach programs carried out by local government.

SW 5.03. The Federal government should provide funding and support for continuation of public education programs on waste management issues.

SCAG ACTIONS

SW 5.04. SCAG shall support the development of public education and outreach efforts to increase awareness of the benefits of a regional zero waste policy.

Strategic Initiatives

SW Strategic 1:

Federal, State and local governments should support and implement source reduction policies which promote product stewardship through the following actions:

1.01S: Support and encourage Federal and State legislation that create incentives for participation in Extended Producer Responsibility such as, encouraging public-private partnerships with product stewardship goals (e.g. The European Green Dot system) and offering incentives to producers who use recycled content to encourage growth in the recycled contents market.

1.02S: Create ordinances with extended producer responsibility (EPR) policies that require producers and manufacturers to produce "sustainable" packaging and products, develop life cycle assessments for products, as well as, support the development of infrastructure and markets for the recycling and reuse of these products. *EPR principles that should be included are: increasing the useful life of products through durability and reparability; increasing production efficiency to produce less production waste and less packaging waste; increasing recyclable material content and reducing virgin material content; facilitating material or product reuse; and decreasing of the toxicity of products. Packaging should be easily recyclable or biodegradable based on any number of EPR strategies including, Design for the Environment (DfE) or Design for Disassembly (DfD) principles.* For example, businesses such as, takeout food distributors, should utilize packaging that is compatible with recycling and composting options available.

1.03S: Create ordinances that ban items from landfill disposal (e.g., construction and demolition material) or ban the use of materials that cannot be recycled to prevent the material from entering the waste stream (e.g, styrofoam and other unrecyclable, plastic fast-food packaging).

1.04S: Add a packaging tax with rates based on the environmental impacts of different packaging materials (based on Danish system); require that companies take back certain types of packaging for reuse or recycling; or add a levy, quota, or ban on one-way beverage containers or require the use of refillable beverage containers only.

1.05S: Add a packaging tax with rates based on the environmental impacts of different packaging materials (based on Danish system); require that companies take back certain types of packaging for reuse or recycling; or add a levy, quota, or ban on one-way beverage containers or require the use of refillable beverage containers only.

SW Strategic 2:

Federal and State and local governments should institute "eco-taxes" and EPR initiatives that require companies to internalize environmental damage costs associated with their products and help companies derive profit from resource efficiency. These would include the following actions:

2.01S: Institute Pay As You Throw (PAYT) trash disposal systems.

2.02S: Identify and alter tax policies that enhance polluting industries and products at the expense of more environmentally benign systems and goods such as, shifting taxes from income and labor ("goods") to resource depletion, wasting, and polluting activities ("bads") and ending government subsidies that promote virgin materials extraction, processing, and manufacturing activities.

2.03S: Add a packaging tax with rates based on the environmental impacts of different packaging materials (based on Danish system); require that companies take back certain types of packaging for reuse or recycling; add a levy, quota, or ban on one-way beverage containers or require the use of refillable beverage containers only.